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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,060	10/31/2001	Mason B. Cabot	10559-563001/P12178	3536

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EXAMINER

RUTTEN, JAMES D

ART UNIT

PAPER NUMBER

2122

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/002,060	Applicant(s) CABOT ET AL.	
	Examiner J. Derek Rutten	Art Unit 2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 31 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 6 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,718,286 to Rivin et al. (hereinafter "Rivin").

As per claim 1, Rivin discloses:

A method of sampling data (column 8 line 64 – column 10 line 10), *comprising:*

gathering a first data sample during execution of a program; executing the program during a random inter-sample period; and gathering a second data sample following the inter-sample period (column 2 lines 21-24: "The foregoing needs are addressed, and advantages obtained, by the use of a statistical profiling method which non-intrusively **samples** the processor's program counter in a **random** manner." The technique of profiling with sampling inherently provides execution of a program between the gathering of samples, otherwise program data would not be available for profile analysis.).

As per claim 6, the above rejection of claim 1 is incorporated. Rivin further discloses: *wherein gathering the first data sample comprises: resetting data gathering hardware, executing the program during a sampling period; and stopping the data gathering hardware at the end of the sampling period* (column 5 lines 36-46: Comment: Data gathering hardware is reset using the SAMPLE and DISABLE signals, the sample is collected, and the hardware is stopped through the removal of the signal).

As per claim 7, the above rejection of claim 1 is incorporated. Rivin further discloses: *wherein gathering the first data sample comprises: starting data gathering hardware, executing the program during a sampling period; and stopping the data gathering hardware at the end of the sampling period* (column 5 lines 36-46: Comment: Data gathering hardware is started using the SAMPLE signal, the sample is collected, and the hardware is stopped through the removal of the signal).

3. Claims 20, 25, and 26 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Background description appearing on pages 1 and 2 of the originally filed specification (hereinafter referred to as "the background section").

As per claim 20, the background section discloses:

An apparatus for sampling data (page 1 lines 9-16), *a memory that stores executable instructions; and a computer processor that executes the instructions* (page 1

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lines 9-11: "computer processor executing an application" Comment:

Applications are inherently provided to processor hardware from a memory storage location, otherwise it would be necessarily be implemented within the hardware itself.)

to:

gather a first data sample during execution of an application; and gather a second data sample following an inter-sample period (page 1 lines 17-21:

"Generally, to obtain a sample of data, a sampling program interrupts the application being executed by the computer processor and then executes the sampling program **to obtain a data sample**. The sampling program is **executed several times** to obtain a set of data samples." Also page 2 lines 13-15:

"One way of reducing sampling overhead is to increase the **sampling period**, i.e., the time between the taking of samples.").

As per claim 25, the above rejection of claim 20 is incorporated. The background section further discloses: *data gathering hardware (page 1 lines 12-16), and wherein the computer processor executes instructions to: start the data gathering hardware and stop the data gathering hardware (page 2 lines 3-6 describe duration of execution of the sampling program which direct the processor to start and stop the data gathering hardware).*

As per claim 26, the above rejection of claim 25 is incorporated. The background section further discloses event count registers (page 1 lines 12-16).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-5, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rivin as applied to claim 1 above, and further in view of U.S. Patent 5,768,500 to Agrawal et al. (hereinafter referred to as "Agrawal").

As per claim 2, the above rejection of claim 1 is incorporated. Rivin does not expressly disclose: *generating an inter-sample count; and decrementing the inter-sample count to zero before gathering the second data sample.*

However, in an analogous environment, Agrawal teaches the use of an event detector that triggers an interrupt for sampling when a count reaches a certain value (column 2 lines 37-41; also column 8 lines 26-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Agrawal's counter with Rivin's random sampling method. One of ordinary skill would have been motivated to

implementing a systematic method for generating an interrupt to trigger a sample gathering event.

As per claim 3, the above rejection of claim 2 is incorporated. Rivin further discloses: *performing overhead operations during the inter-sample period* (column 6 lines 54-60).

As per claim 4, the above rejection of claim 3 is incorporated. Rivin further discloses : *wherein the inter-sample count is longer than an execution time required to perform the overhead operations* (column 4 lines 3-6 describes a sequential sampling which inherently requires that the sample is stored before another sample is collected.).

As per claim 5, the above rejection of claim 3 is incorporated. Rivin further discloses: *wherein the overhead operations include at least one of decrementing the inter-sample count, storing a data sample, and performing a calculation based on a data sample* (column 6 lines 54-60).

As per claim 8, the above rejection of claim 7 is incorporated. Rivin does not expressly disclose event counters. However, Agrawal teaches the use of event counter registers (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Agrawal's registers with Rivin's sampling method.

One of ordinary skill would have been motivated to track the execution of a program and collect samples based on the frequency of interesting events.

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rivin and Agrawal as applied to claim 2 above, and further in view of U.S. Patent 3,700,869 to Low et al. (hereinafter "Low").

As per claim 9, the above rejection of claim 9 is incorporated. Rivin and Agrawal do not expressly disclose a linear feedback shift register.

However, in an analogous environment, Low teaches that a linear feedback shift register can be used to produce a random bit pattern (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Low's teaching of a linear feedback shift register in Agrawal's counter with Rivin's sampling method. One of ordinary skill would have been motivated to use an efficient arrangement for generating a random binary sequence.

As per claim 10, the above rejection of claim 9 is incorporated. Rivin and Agrawal do not expressly disclose primitive trinomials.

However, Low teaches a linear feedback shift register that is characterized by a primitive trinomial (column 1 lines 26-28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Low's primitive trinomials corresponding to a linear feedback shift register in Agrawal's counter with

Rivin's sampling method. One of ordinary skill would have been motivated to use a binary sequence corresponding to a primitive trinomial since it is a natural characteristic of using a two-tap linear feedback register which provides an efficient arrangement for generating a random binary sequence.

7. Claims 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rivin in view of U.S. Patent 6,070,009 to Dean et al. (hereinafter "Dean").

As per claim 11, Rivin does not expressly disclose: *An article comprising a machine-readable medium that stores machine-executable instructions for sampling data.*

All further limitations have been addressed in the above rejection of claim 1.

However, in an analogous environment, Dean teaches use of a computer program product comprising a computer readable medium storing instructions for sampling data (column 28 lines 43-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Dean's computer program product with Rivin's sampling technique. One of ordinary skill would have been motivated to store and distribute executable code to other users that are interested in execution profiling and sampling.

As per claim 16, the above rejection of claim 11 is incorporated. All further limitations have been addressed in the above rejection of claim 7.

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8. Claims 12-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rivin and Dean as applied to claim 11 above, and further in view of Agrawal.

As per claims 12-15, the above rejection of claim 11 is incorporated. All further limitations have been addressed in the above rejections of claims 2-5, respectively.

As per claim 17, the above rejection of claim 16 is incorporated. All further limitations have been addressed in the above rejection of claim 8.

9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rivin, Dean and Agrawal as applied to claim 12 above, and further in view of Low.

As per claims 18 and 19, the above rejection of claim 12 is incorporated. All further limitations have been addressed in the above rejections of claims 9 and 10, respectively.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over the background section as applied to claim 20 above, and further in view of Agrawal.

As per claim 21, the above rejection of claim 20 is incorporated. The background section does not expressly disclose: *a decrementing register; generating an inter-sample*

count; and decrementing the inter-sample count to zero before gathering the second data sample.

All further limitations have been addressed in the above rejection of claim 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Agrawal's counter with the sampling method of the background section. One of ordinary skill would have been motivated to implementing a systematic method for generating an interrupt to trigger a sample gathering event.

11. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the background section and Agrawal as applied to claim 22 above, and further in view of prior art of record "Interrupts", Daqarta, DMA, and FIFO, 2001, appearing on the Information Disclosure Statement by Applicant as designation "AR" dated March 31, 2003 (hereinafter "Daqarta").

As per claim 22, the above rejection of claim 21 is incorporated. The background section discloses overhead operations (page 2 lines 6-12). The background section does not expressly disclose: *during the inter-sample period.*

However, in an analogous environment, Daqarta teaches that overhead operations are performed during an inter-sample period (page 1 paragraph 1; Intersample period is inherent since the system has been interrupted while the overhead takes place.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Daqarta's teaching of overhead processing with the background section's. One of

ordinary skill would have been motivated to store one sample before sampling again to avoid overwriting the previous sample.

As per claim 23, the above rejection of claim 22 is incorporated. The background section further discloses increasing the time between samples (page 2 lines 13-15; Comment: This inherently requires an inter-sample time longer than overhead execution, since if it was not, then the entire time would be spent on overhead, and no program execution could be accomplished).

As per claim 24, the above rejection of claim 22 is incorporated. The background section further discloses: *perform overhead operations that include instructions for at least one of decrementing the inter-sample count, storing a data sample, and perform a calculation based on a data sample* (page 2 lines 6-12).

12. Claims 27 and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the background section and Agrawal as applied to claim 21 above, and further in view of Low.

As per claim 27, the above rejection of claim 21 is incorporated. The background section and Agrawal do not expressly disclose: *a linear feedback shift register, and wherein the computer processor executes an instruction to enable the linear feedback shift register to produce a bit pattern that corresponds the inter-sample count.*

However, in an analogous environment, Low teaches that a linear feedback shift register can be used to produce a random bit pattern (Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Low's teaching of a linear feedback shift register in Agrawal's counter with the sampling method disclosed in the background section. One of ordinary skill would have been motivated to use an efficient arrangement for generating a random binary sequence.

As per claim 28, the above rejection of claim 27 is incorporated. The background section and Agrawal do not expressly disclose primitive trinomials.

However, Low teaches a linear feedback shift register that is characterized by a primitive trinomial (column 1 lines 26-28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Low's primitive trinomials corresponding to a linear feedback shift register in Agrawal's counter with the sampling method of the background section. One of ordinary skill would have been motivated to use a binary sequence corresponding to a primitive trinomial since it is a natural characteristic of using a two-tap linear feedback register which provides an efficient arrangement for generating a random binary sequence.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Derek Rutten whose telephone number is (703) 605-5233. The examiner can normally be reached on M-F 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jdr



**ANTONY NGUYEN-BA
PRIMARY EXAMINER**